# Bringing It All Together:  SOA – Cloud – Semantic Integration
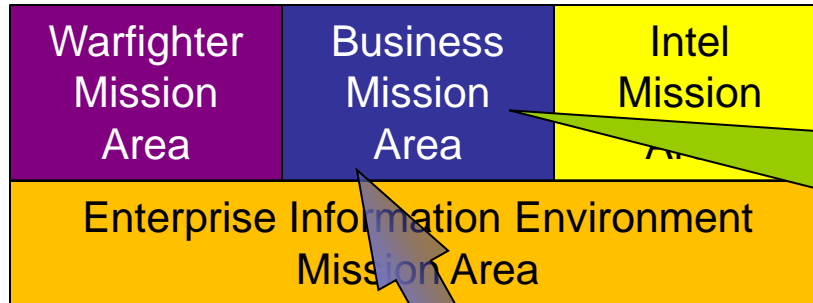
Dennis E. Wisnosky,
DoD BMA CTO &
Chief Architect in the
Office of the Deputy Chief
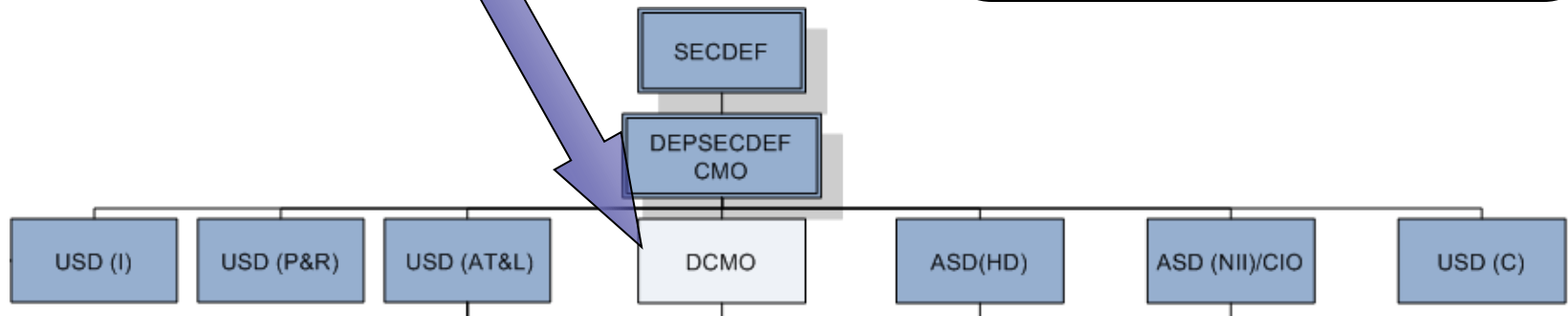Management Officer

April 21, 2010

# DCMO CTO/CA

**Missions of the DoD**

| Warfighter Mission Area | Business Mission Area | Intel Mission Area |
|---|---|---|
| Enterprise Information Environment Mission Area | | |

**The Business Operating Environment (BOE)**

SECDEF

DEPSECDEF CMO

USD (I) — USD (P&R) — USD (AT&L) — DCMO — ASD(HD) — ASD (NII)/CIO — USD (C)

*Dennis E. Wisnosky, DoD BMA CTO & Chief Architect in the Office of the Deputy Chief Management Officer (DCMO)*
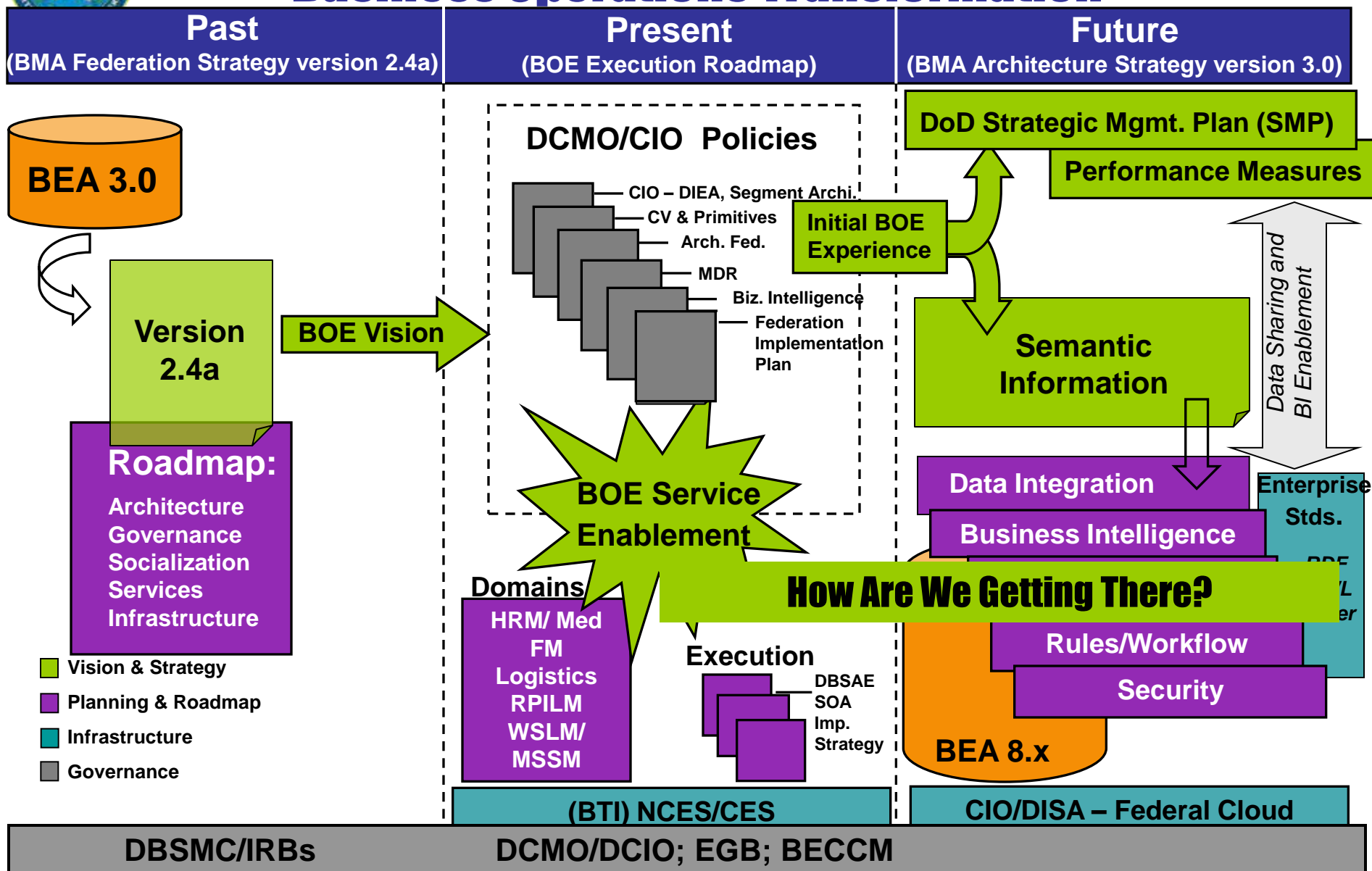
# The Business Operating Environment

## Reach of the Business Mission Area

"The Secretary of Defense is responsible for a half-trillion dollar enterprise that is roughly an order of magnitude larger than any commercial corporation that has ever existed. DoD estimates that business support activities—the Defense Agencies and the business support operations within the Military Departments—comprise 53% of the DoD enterprise."

# Strategy and Roadmap for DoD Business Operations Transformation

| Past | Present | Future |
|---|---|---|
| **(BMA Federation Strategy version 2.4a)** | **(BOE Execution Roadmap)** | **(BMA Architecture Strategy version 3.0)** |

**BEA 3.0**

**Version 2.4a**

→ **BOE Vision** →

### DCMO/CIO Policies

- CIO – DIEA, Segment Archi.
- CV & Primitives
- Arch. Fed.
- MDR
- Biz. Intelligence
- Federation Implementation Plan

**DoD Strategic Mgmt. Plan (SMP)**

**Performance Measures**

**Initial BOE Experience**

**Semantic Information**

*Data Sharing and BI Enablement*

## Roadmap:

**Architecture**
**Governance**
**Socialization**
**Services**
**Infrastructure**

**BOE Service Enablement**

**Domains**

**HRM/ Med**
**FM**
**Logistics**
**RPILM**
**WSLM/ MSSM**

**Execution**

DBSAE
SOA
Imp. Strategy

**Data Integration**

**Business Intelligence**

**How Are We Getting There?**

**Rules/Workflow**

**Security**

**Enterprise Stds.**

RDF
OWL
er

**BEA 8.x**

- ■ Vision & Strategy
- ■ Planning & Roadmap
- ■ Infrastructure
- ■ Governance

**(BTI) NCES/CES**

**CIO/DISA – Federal Cloud**

**DBSMC/IRBs**

**DCMO/DCIO; EGB; BECCM**

# Websites for SOA and Business Operating Environment Updates

## By Reaching Out

**http://www.bta.mil/products/training/SOA/index.html**

**http://www.bta.mil/products/bea_7_0/BEA/html_files/soa.html**



### Number of hits on SOA Training Web Site

| Month | Hits |
|-------|------|
| Mar-09 | 1261 |
| Apr-09 | 3076 |
| May-09 | 1616 |
| Jun-09 | 850 |
| Jul-09 | 911 |
| Aug-09 | 1937 |
| Sep-09 | 1191 |
| Oct-09 | 1115 |
| Nov-09 | 961 |
| Dec-09 | 659 |
| Jan-10 | 488 |
| Feb-10 | 1035 |
| Mar-10 | 1323 |

## How Are We Getting There?

# Roadmap for DoD Business Operations Transformation
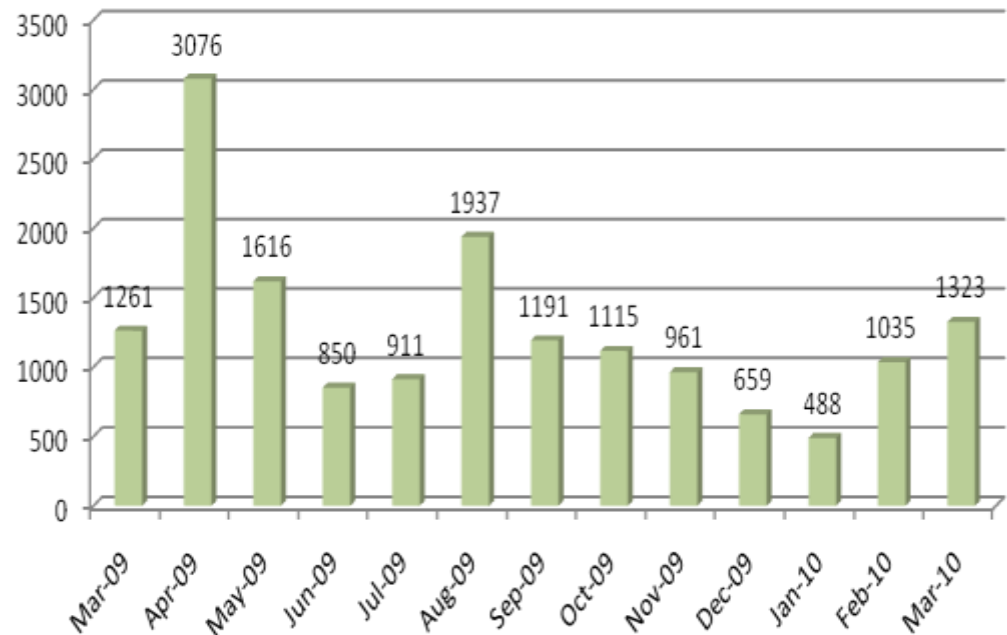
## By Roadmap



Draft Roadmap for DoD Business Operations Transformations

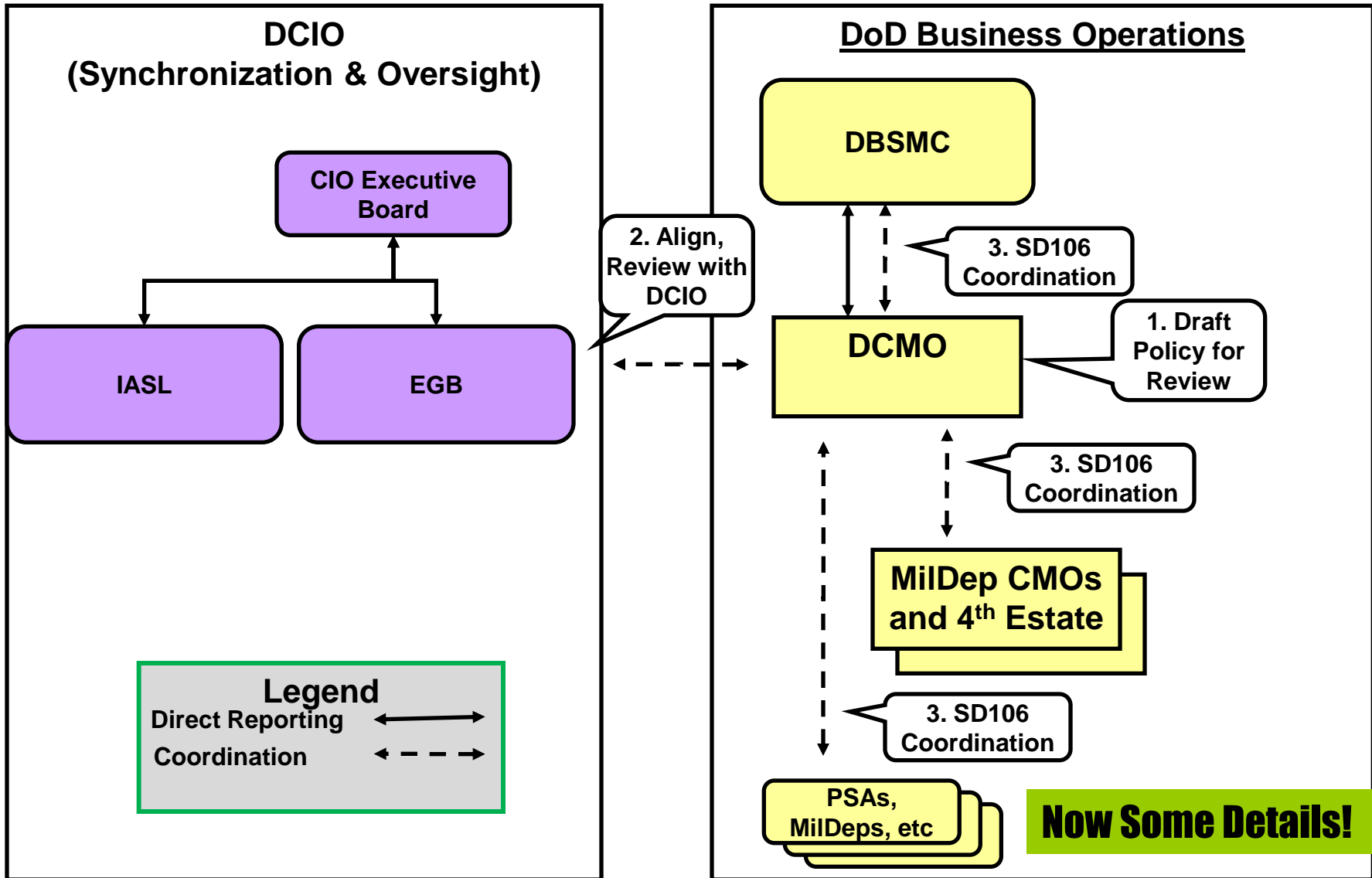## By Policy!

# Interoperability Policy Goals:

## Objective: De-conflict redundant capabilities and informational silos

1. Policy to Establish functional interoperability through informational interoperability

   - Identify redundant capabilities using common vocabulary
   - Create understandable business processes using standardized representation (Primitives)
   - Create consistent and reusable vocabularies using CARP*

2. Policy to Limit the creation of new data services to only those cases when they cannot be created from existing information exchanges

3. Policy to Remove the need for custom interfaces by creating implicit interoperability

   - Make information understandable using information models
   - Create standardized and reusable methods for accessing data
   - Create physical instantiation of the common vocabulary

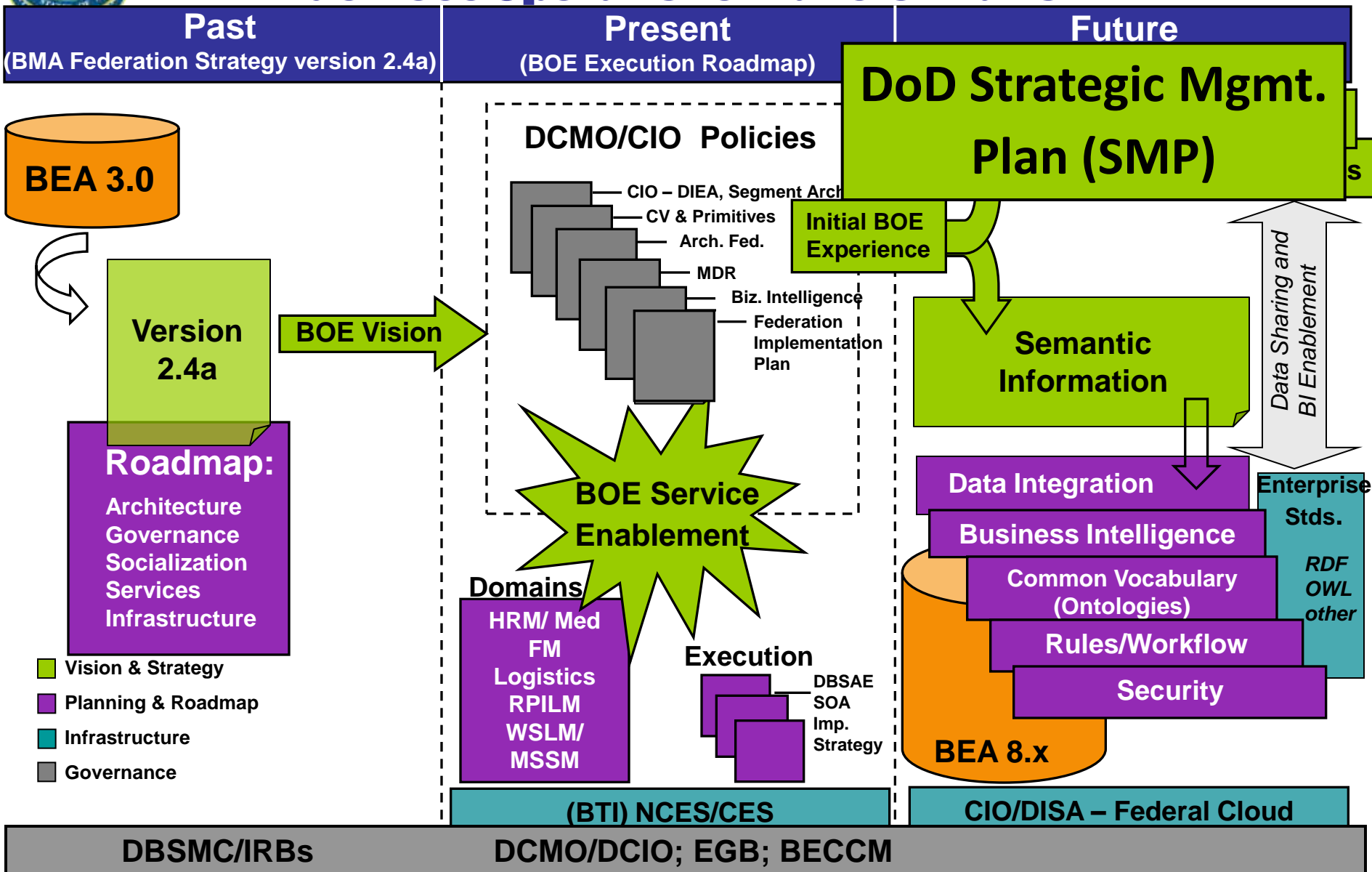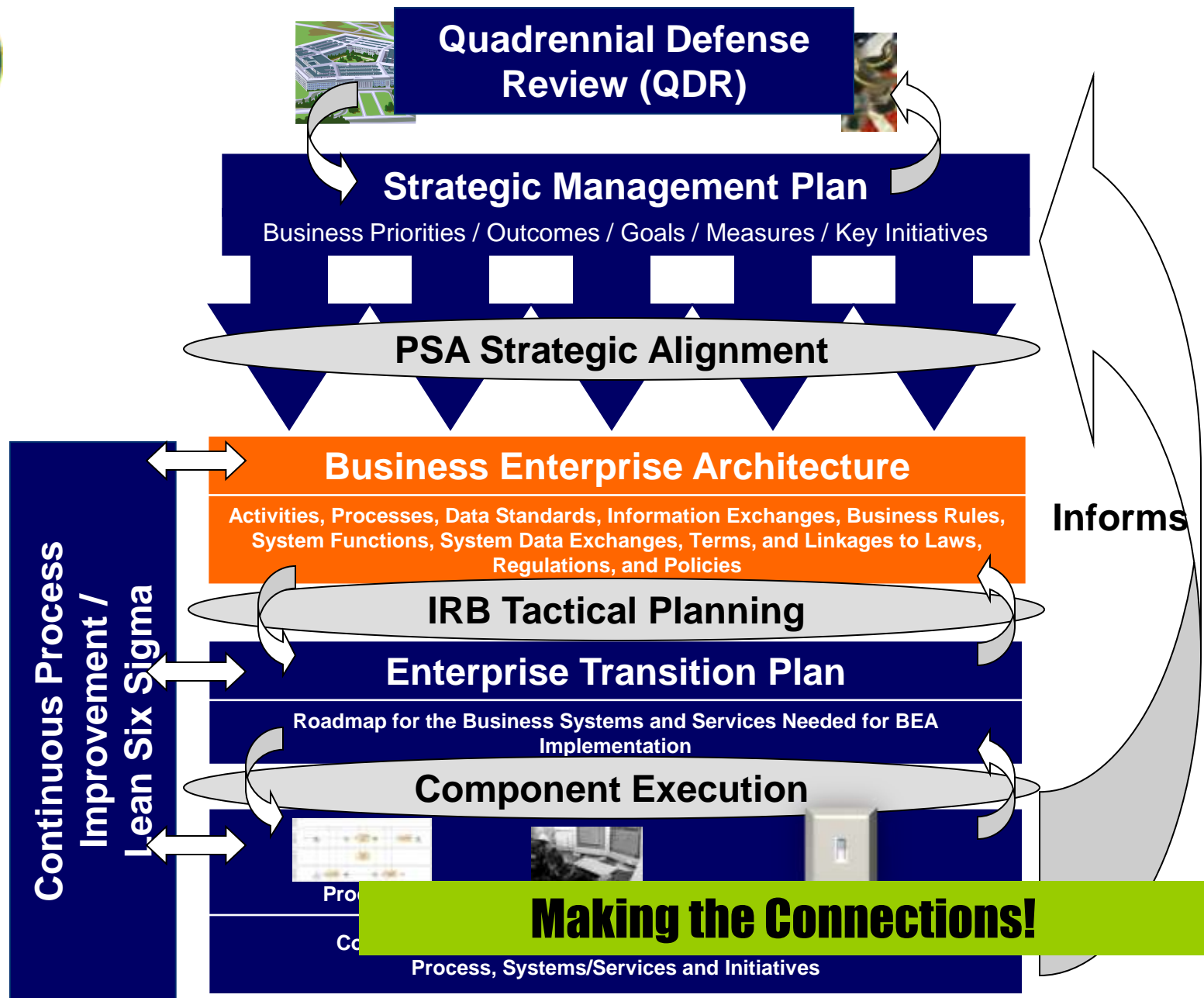**\*Reference DoDAF 2.0 Journal Best Practices, Architecture Methodology**

# Joint Policy Approach

**DCIO (Synchronization & Oversight)**

- CIO Executive Board
  - IASL
  - EGB

**DoD Business Operations**

- DBSMC
- DCMO
- MilDep CMOs and 4th Estate
- PSAs, MilDeps, etc

2. Align, Review with DCIO

3. SD106 Coordination

1. Draft Policy for Review

3. SD106 Coordination

3. SD106 Coordination

**Now Some Details!**

**Legend**
Direct Reporting ←→
Coordination ←--→

# Where We Are Heading!

## The BOE Vision – Version 3.0

# Strategy and Roadmap for DoD Business Operations Transformation

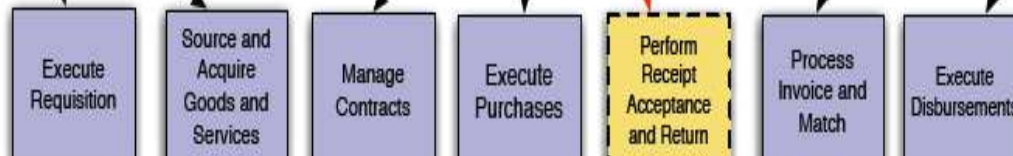**Quadrennial Defense Review (QDR)**

**Strategic Management Plan**

Business Priorities / Outcomes / Goals / Measures / Key Initiatives

**PSA Strategic Alignment**

**Business Enterprise Architecture**

Activities, Processes, Data Standards, Information Exchanges, Business Rules, System Functions, System Data Exchanges, Terms, and Linkages to Laws, Regulations, and Policies

**IRB Tactical Planning**

**Enterprise Transition Plan**

Roadmap for the Business Systems and Services Needed for BEA Implementation

**Component Execution**

**Continuous Process Improvement / Lean Six Sigma**

**Informs**

Pro...

Co...

Process, Systems/Services and Initiatives

**Making the Connections!**

# SMP- E2E - BEA

SMP to Detailed E2E in the BEA

# SMP- E2E - BEA

SMP to Detailed E2E in the BEA

The BEA Views are Supported by Common Vocabularies
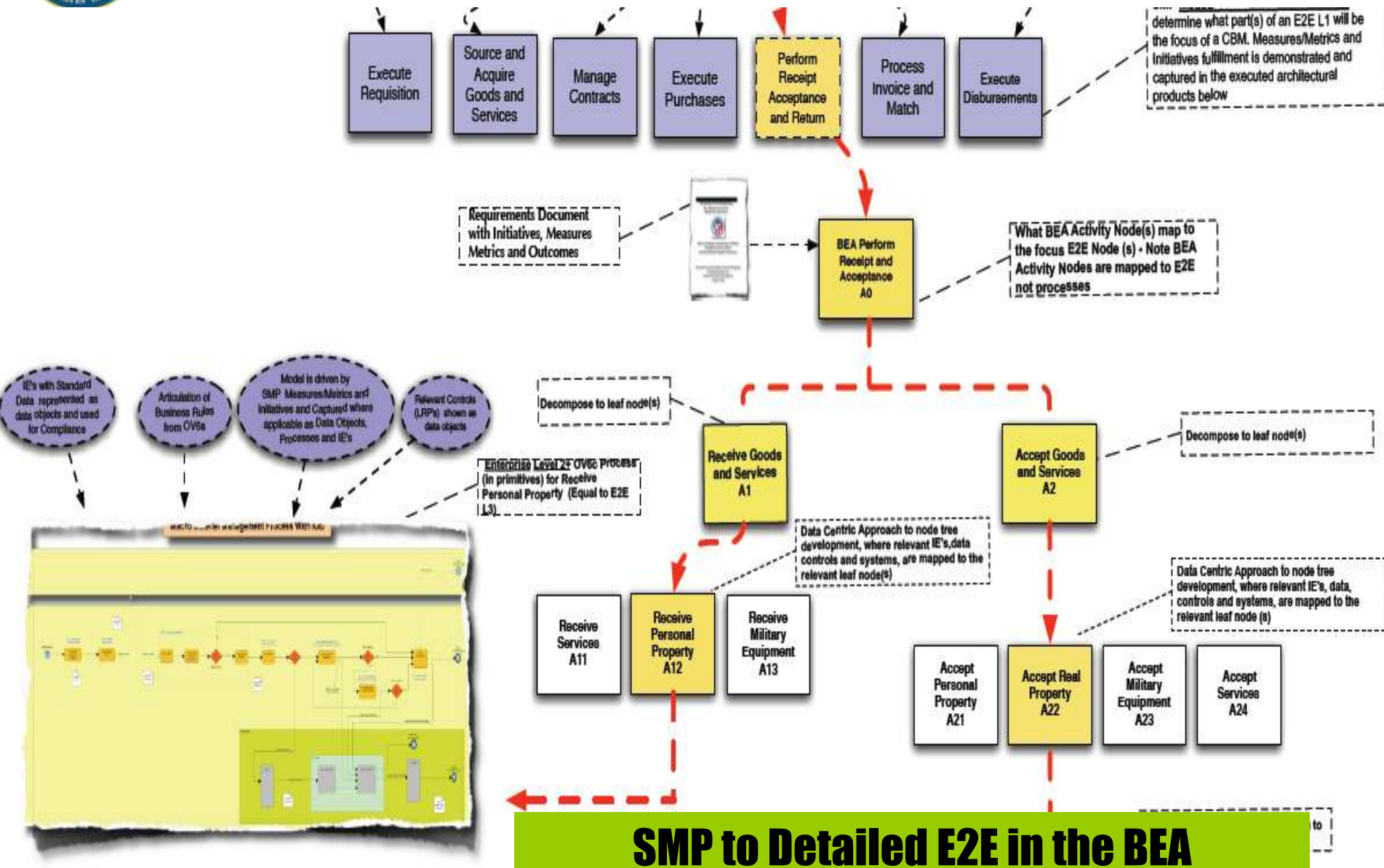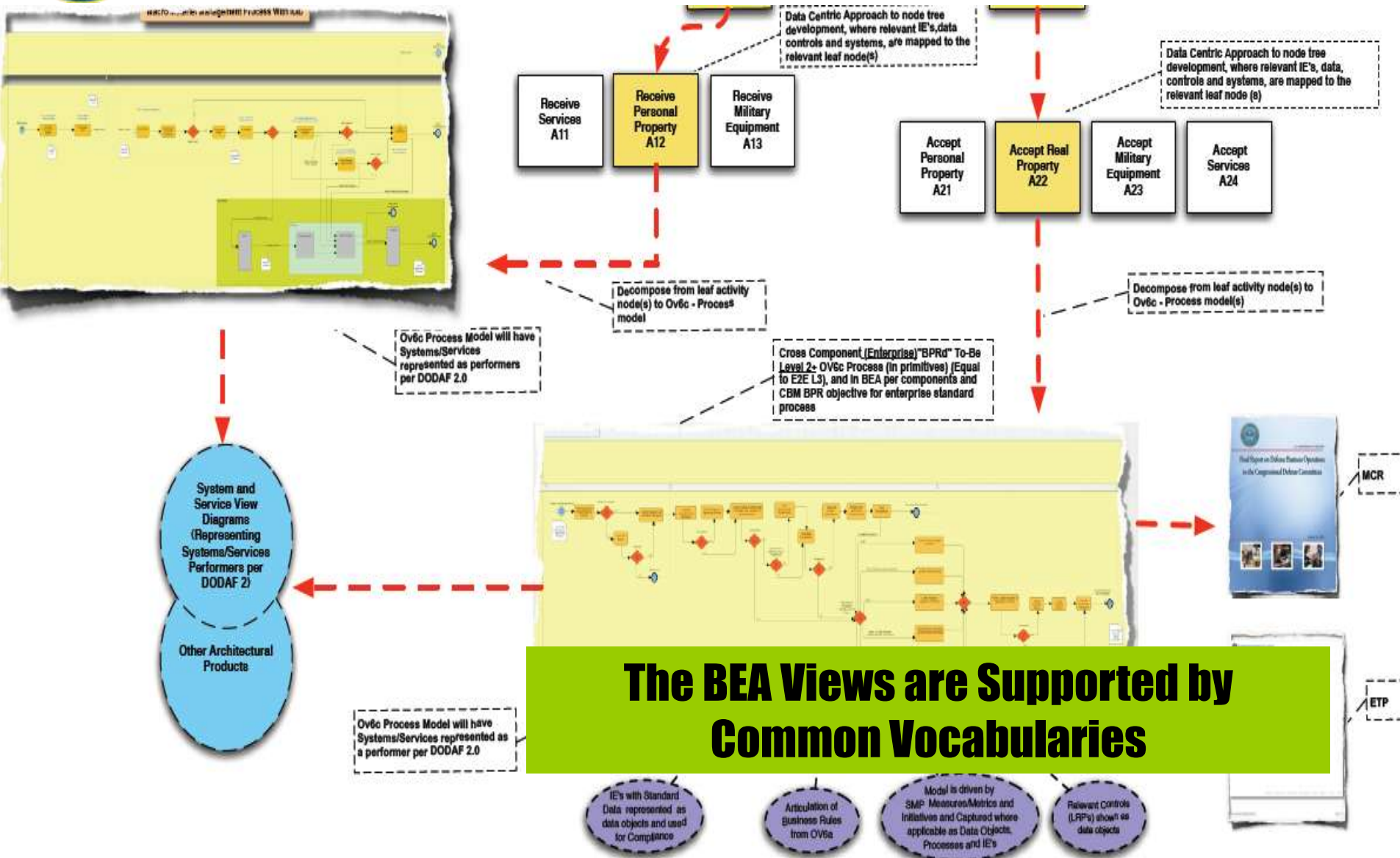
# Common Vocabulary

**Functional / Requirements**

**Building the Vocabulary**

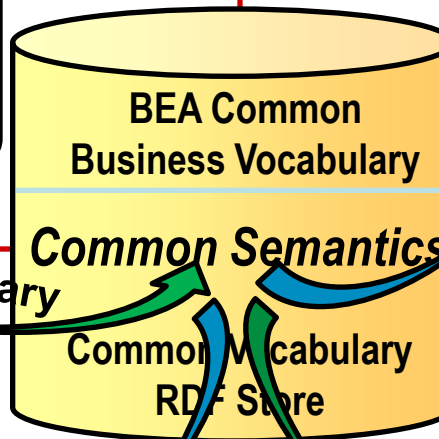**Using the Vocabulary**

**Technical / Systems**

- Governance
- Identify Conflicts
- Resolve Conflicts
- Review Vocabulary
- Approve Vocabulary

- Architecture
- C.A.R.P. / AV-2 Template
- Match Terms
- Build Models / Primitives
- Validate Models

**BEA Common Business Vocabulary**

*Common Semantics*

Common Vocabulary RDF Store

*common vocabulary*

*mediation*

*common vocabulary*

- Alignment
- Unify Format
- Parse Input
- Cleanse Vocabulary
- Match Terms
- Publish Results

- Mediation & Virtualization
- Routing
- Content-based
- Protocol Adaptation
- Messaging

**CARP Ensures Common Vocabulary Use!**

*Legacy Systems*

*Virtualization*

# Building Common Vocabularies

| What is the architecture supposed to achieve? | Which processes/activities will provide the capabilities? | Which data/resources will be consumed or produced? | Who/What will be involved? |

**Capability Vocabulary** → **Activity Vocabulary** → **Resource Vocabulary** → **Performer Vocabulary**

**Items:**
- Objectives
- Features
- Services

**Items:**
- Verbs

**Items:**
- Nouns

**Items:**
- Roles
- Systems
- Actors

**Capability View** | **Process View** | **Data & Rule View** | **Process View**

# Common Vocabulary Environment



**Business Enterprise Architecture (BEA)**

DoD CV

Common Vocab Engine

BEA

Semantic Matching Automation

User Interface
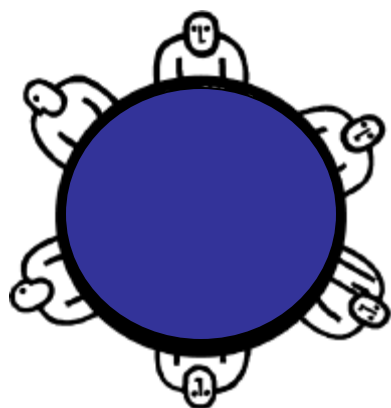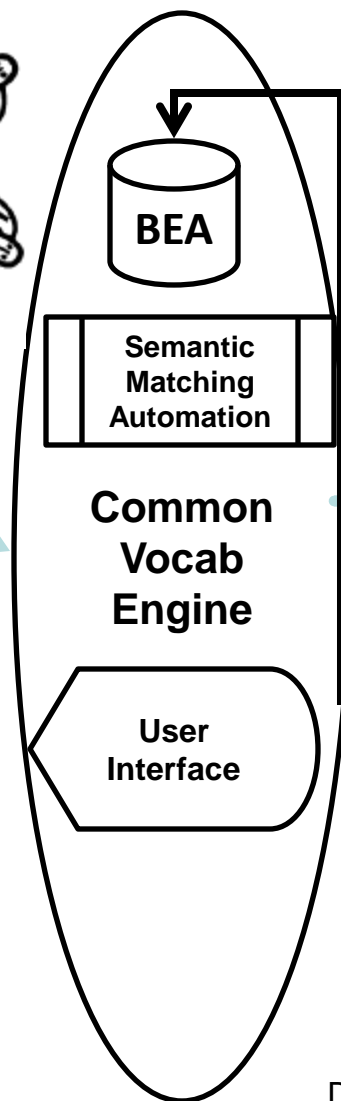
IRB Process Automation

OWL Conversion Process

Standards Analysis Process
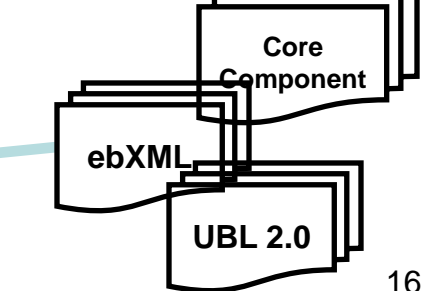
Business Enterprise Common Core Metadata (BECCM Vocab P...)

Logical to Physical Process

Investment Review Board (IRB)

Semantic Environment (Business Intelligence)

Standards

Core Business (BECCM)

Global Exchange (GEX)

Human Resources

Real Property Inventory Requirements

Standard Financial Information Structure

Procurement Data Standards

Performance Metrics - Performance Data Automation

Enterprise Information Web

Units of Measure

Country Code

Core Component

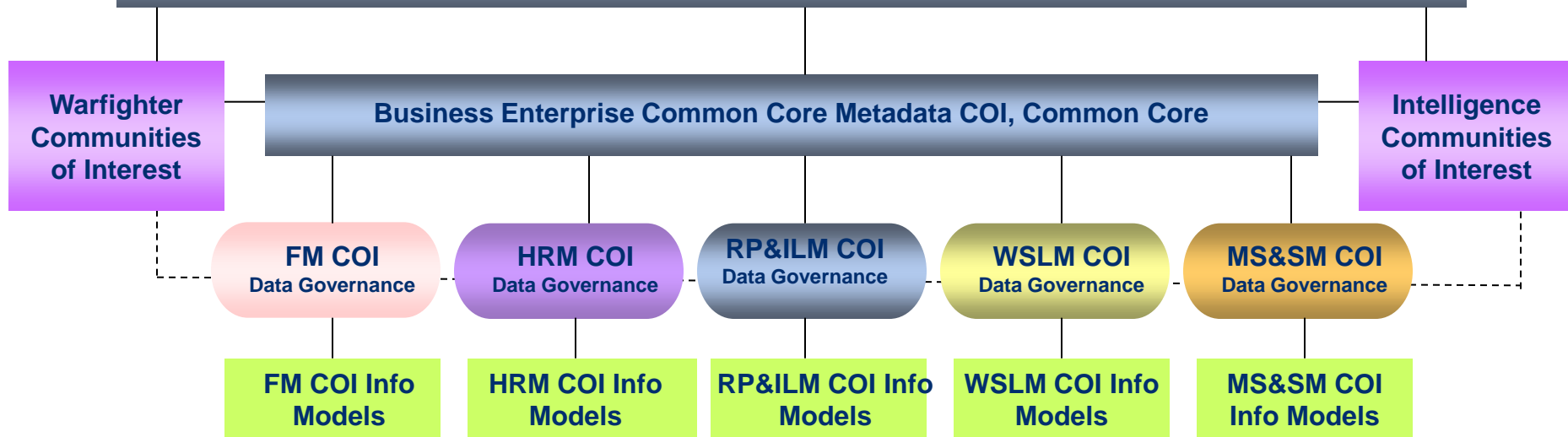ebXML

UBL 2.0
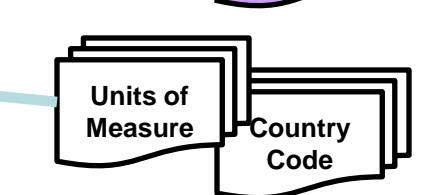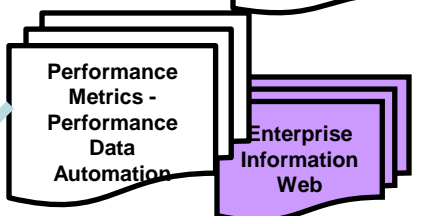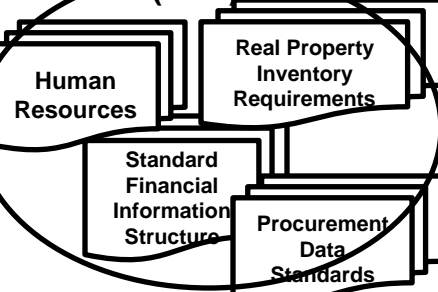
**Governance is Key**

# Adjudicating the Business Enterprise Common Vocabulary

The BECCM COI provides governance for the DoD's end-to-end business process enterprise standards

- In the event consensus on enterprise standards cannot be reached at the CO... adjudicate across functional areas

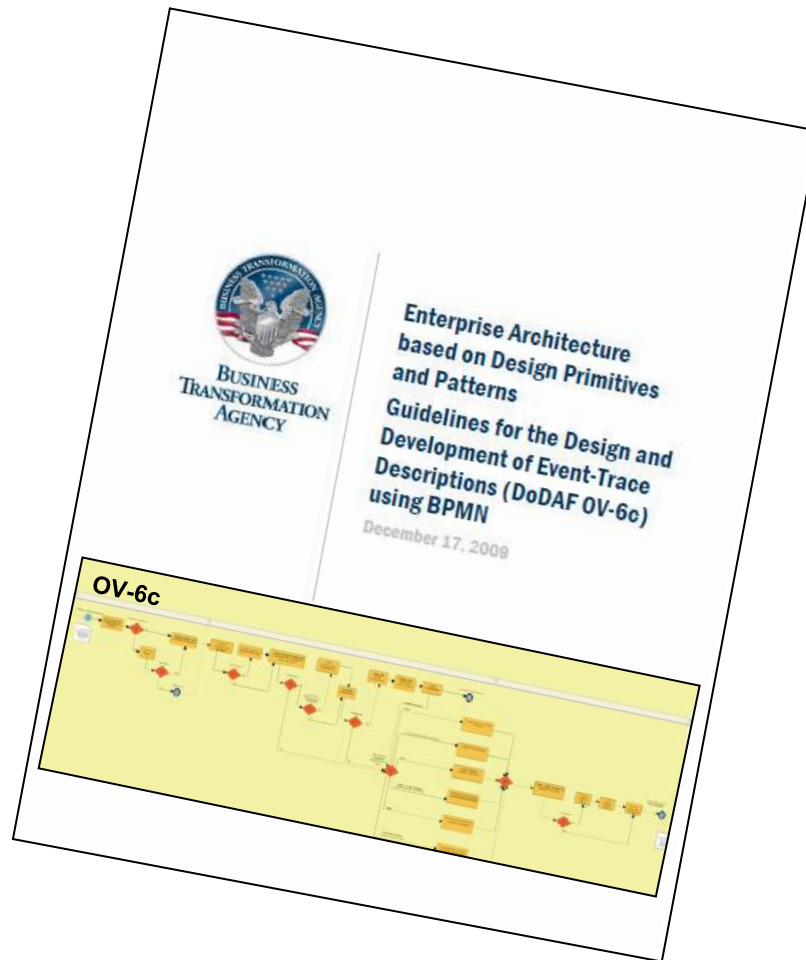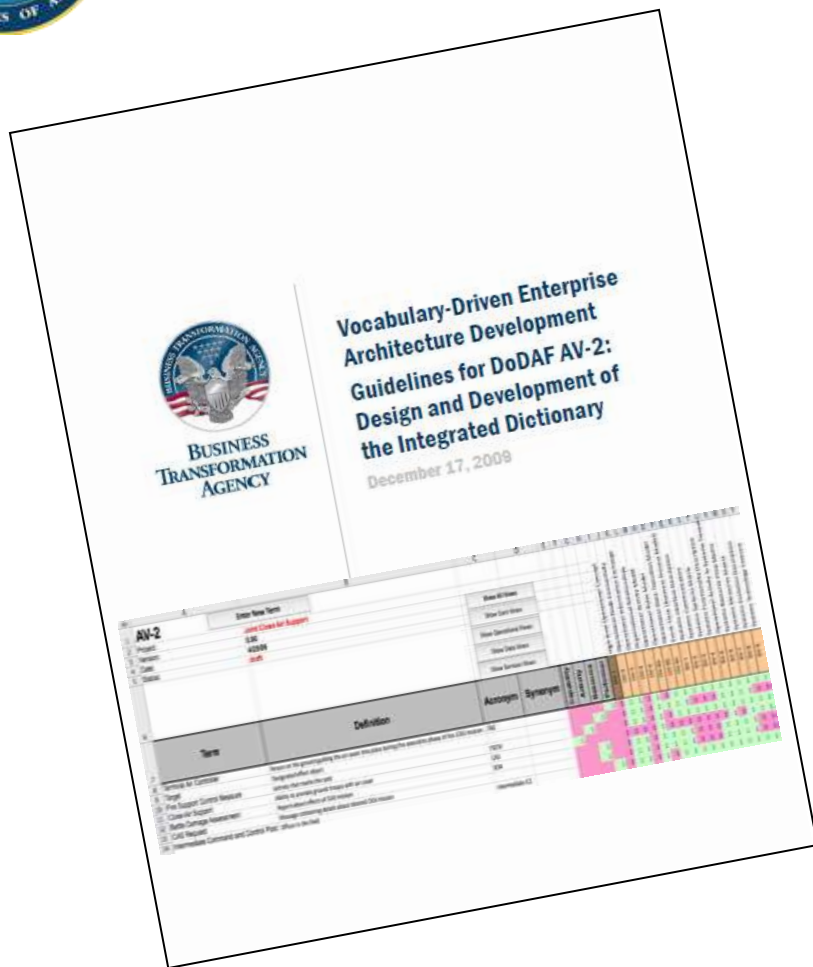**Primitives to Patterns to BI!**

**DoD Governance of DoD Core Data, Universal Core**

**Warfighter Communities of Interest**

**Business Enterprise Common Core Metadata COI, Common Core**

**Intelligence Communities of Interest**

| **FM COI** Data Governance | **HRM COI** Data Governance | **RP&ILM COI** Data Governance | **WSLM COI** Data Governance | **MS&SM COI** Data Governance |
|---|---|---|---|---|
| **FM COI Info Models** | **HRM COI Info Models** | **RP&ILM COI Info Models** | **WSLM COI Info Models** | **MS&SM COI Info Models** |

# Architecture Primitives Series
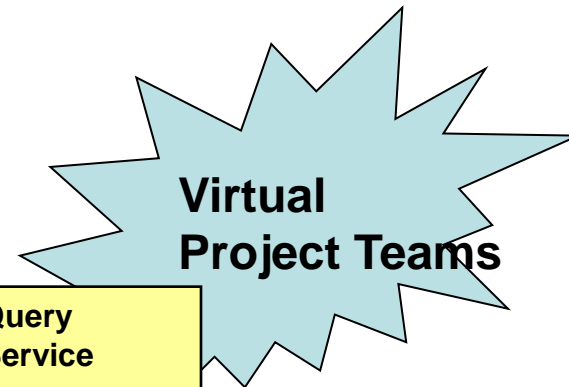


**DoD Architecture Framework Processes Best-Practice**

**http://cio-nii.defense.gov/sites/dodaf20/journal_exp3.html**

**The Design Pattern!**

# BI Design Pattern



Ad Hoc and Standard Displays

DCMO Business Operations

Source Data Values

Query Service

Virtual Project Teams

Service Pulls Data

Authoritative Process Data

Performance Service Level Agreements

Primitives Compliant Business Process Model
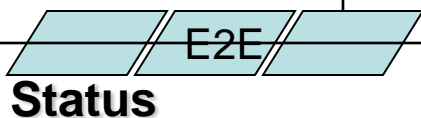
Services, Components, Agencies

OSD

External Sources

Status

E2E

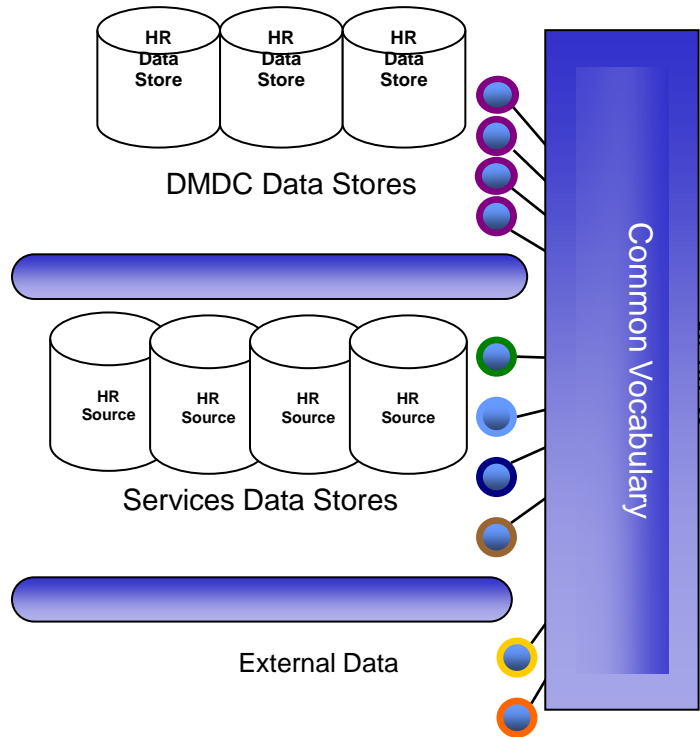The HR Enterprise Information Web (EIW) is an Application of the BI Design Pattern
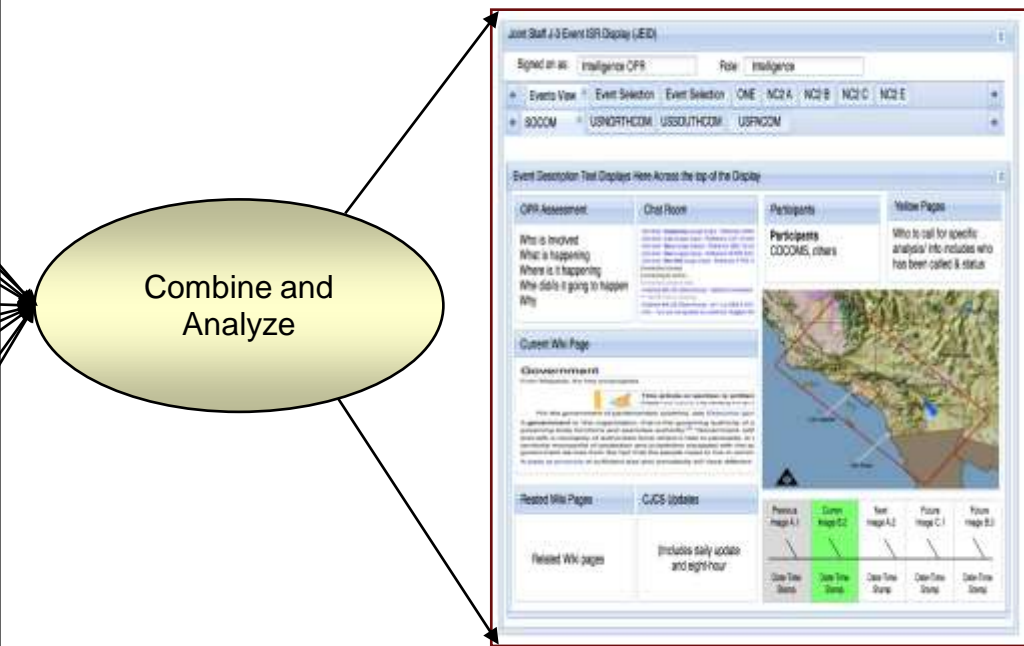
Owners make data available
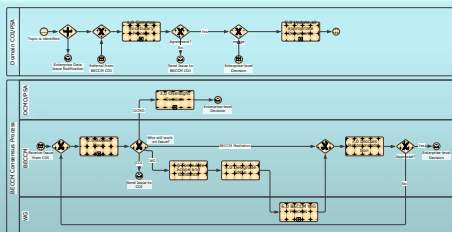
# HR EIW BI Example



**Multiple Sources**

**Single view**

DMDC Data Stores

HR Data Store | HR Data Store | HR Data Store

Services Data Stores

HR Source | HR Source | HR Source | HR Source

External Data

Common Vocabulary

Combine and Analyze

# Combine multiple data and service sources into single view

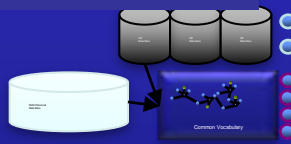## All of the Pieces Fit Together!

# All of the Pieces Together!



**Governance**

Governance Processes

**Standard Representation and Composition**

Primitives & Design Patterns

Interoperable and Federated

Secure and Resilient

**Data Sources**

Authoritative Data Stores

Component Data Stores

External Data Services

Common Vocabulary
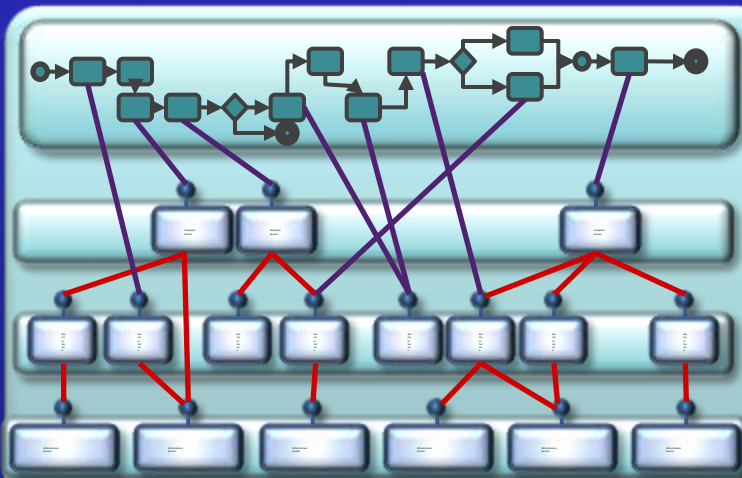
Available and Efficient

*Data Presentation*

**Dynamic Composition**

End-to-End Processes

# Thank you!

Questions?
Dennis.Wisnosky@osd.mil